CLAIMS

We claim:

1. Substantially pure O1-236 (Npm2) having the amino acid sequence set forth in Fig. 2 (SEQ ID NO: 17).
2. An isolated polynucleotide having the polynucleotide sequence set forth in Fig. 1 (SEQ ID NO: 16).
3. A transgenic mouse comprising a defect in formation of early cleavage embryos caused by a disruption of its genome in the O1-236 (Npm2) gene.
4. The transgenic mouse of claim 3 wherein said disruption is a homozygous disruption.
5. The transgenic mouse of claim 3 wherein the defect is due to a failure of sperm DNA decondensation in fertilized eggs.
6. The transgenic mouse of claim 3 wherein the defect is due to defective decondensation of the female pronucleus in fertilized eggs.
7. The transgenic mouse of claim 3 wherein said disruption consists of a deletion of exon 2, exon 3 and the exon 4 splice junction.
8. The method of making a transgenic mouse comprising a disruption of its genome in the O1-236 (Npm2) gene, comprising the steps of:

   (a) introducing an O1-236 (Npm2) targeting vector comprising a PGK-hprt expression cassette into a mouse embryonic stem cell;

   (b) selecting for the mutation of the O1-236 (Npm2) gene in embryonic stem cells;

   (c) introducing said mouse embryonic stem cells with the mutation of the O1-236 (Npm2) gene into a mouse blastocyst;

   (d) transplanting said mouse blastocyst into a pseudopregnant mouse;

   (e) allowing said transplanted mouse blastocyst to develop to term; and

   (f) identifying a transgenic mouse comprising a disruption of its genome in the O1-236 (Npm2) gene in at least one allele.
9. The method of claim 8 further comprising the step of breeding two transgenic mice to obtain a transgenic mouse comprising a homozygous disruption of its genome of the (O1-236) Npm2 gene.
10. The method of claim 9 wherein said disruption results in said transgenic mouse exhibiting a defect in formation of early cleavage embryos.
11. A transgenic mouse comprising a disruption of its genome in the O1-180 (Oo1) gene consisting of a deletion of exon 1.
12. The transgenic mouse of claim 11 wherein said disruption is a homozygous disruption.

13. The method of making a transgenic mouse comprising a disruption of its genome in the O1-180 (Oo1) gene, comprising the steps of:

(a) introducing an O1-180 (Oo1) targeting vector comprising a PGK-hprt expression cassette into a mouse embryonic stem cell;

(b) selecting for the mutation of the O1-180 (Oo1) gene in embryonic stem cells;

(c) introducing said mouse embryonic stem cells with the mutation of the O1-180 (Oo1) gene into a mouse blastocyst;

(d) transplanting said mouse blastocyst into a pseudopregnant mouse;

(e) allowing said transplanted mouse blastocyst to develop to term; and

(f) identifying a transgenic mouse comprising a disruption of its genome in the O1-180 (Oo1) gene in at least one allele.

14. The method of claim 13 further comprising the step of breeding two transgenic mice to obtain a transgenic mouse comprising a homozygous disruption of its genome of the O1-180 (Oo1) gene.

15. The method of making a transgenic mouse comprising a disruption of its genome in the O1-184 gene, comprising the steps of:

(a) introducing an O1-184 targeting vector comprising a PGK-hprt expression cassette into a mouse embryonic stem cell;

(b) selecting for the mutation of the O1-184 gene in embryonic stem cells;

(c) introducing said mouse embryonic stem cells with the mutation of the O1-184 gene into a mouse blastocyst;

(d) transplanting said mouse blastocyst into a pseudopregnant mouse;

(e) allowing said transplanted mouse blastocyst to develop to term; and

(f) identifying a transgenic mouse comprising a disruption of its genome in the O1-184 gene in at least one allele.

16. The method of claim 15 further comprising the step of breeding two transgenic mice to obtain a transgenic mouse comprising a homozygous disruption of its genome of the O1-184 gene.

17. The method of making a transgenic mouse comprising a disruption of its genome in more than one of the O1-236 (Npm2), O1-180 (Oo1) or O1-184 genes, comprising the steps of:

(a) introducing an O1-236 (Npm2), O1-180 (Oo1) or O1-184 targeting vector comprising a PGK-hprt expression cassette into a mouse embryonic stem cell;

(b) selecting for the mutation of the O1-236 (Npm2), O1-180 (Oo1) or O1-184 gene in embryonic stem cells;

(c) introducing said mouse embryonic stem cells with the mutation of the O1-236 (Npm2), O1-180 (Oo1) or O1-184 gene into a mouse blastocyst;

(d) transplanting said mouse blastocyst into a pseudopregnant mouse;

(e) allowing said transplanted mouse blastocyst to develop to term; and

(f) identifying a transgenic mouse comprising a disruption of its genome in the O1-236 (Npm2), O1-180 (Oo1) or O1-184 gene in at least one allele.

18. The method of claim 17 further comprising the step of breeding two transgenic mice to obtain a transgenic mouse comprising a homozygous disruption of its genome of the O1-236 (Npm2), O1-180 (Oo1) or O1-184 genes.